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Soil & Water Conservation News

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Key Conservation Issues Discussed at NACD Convention

by Brad Anseth and Dennis Hopper

Two nationally known conservation authorities warned of a pair of crises facing American agriculture: the threat to productivity from soil erosion and the loss of the best farmland to subdivisions and other nonagricultural uses.

The warnings came at the 35th annual convention of the National Association of Conservation Districts (NACD) in San Francisco, February 1 through 5.

"The most serious problem we face is the permanent loss of productivity from the American land," NACD President Lyle Bauer told more than 1,500 conservationists attending the opening session.

Robert Gray, director of the National Agricultural Lands Study, echoed Bauer's statement. In his keynote address, Gray outlined

past trends in land conversion and projected trends to the year 2000.

Bauer's message was couched in terms that his audience of mostly farmers and ranchers understood: The economy is forcing many farmers to choose between paying bills and applying conservation measures.

"Soil erosion remains at critically high levels," Bauer said, "and the severe economic pressures on farmers keep many from making the necessary investments to control erosion."

"They continue to plant crops on marginal, erosive lands because they need to generate all the income they can," the Kansas wheat farmer told convention delegates. "Something needs to be done, and done soon, to provide the economic incentives to help farmers make necessary conservation investments."

Bauer challenged the conservation district leaders to concentrate on local and State efforts in conservation. "The strength of the conservation districts for 40 years has been the willingness of volun-

teer, unpaid conservationists . . . to take the leadership locally."

Gray's keynote speech reinforced Bauer's stand. Speaking on stemming the loss of America's prime farmland, Gray described conservation districts as having the "most effective mechanism for working on this issue."

"If there isn't initiative on the local level (for retaining important farmlands), nothing will happen," Gray said. "We can't look to Washington to solve the loss of agricultural land problem."

Gray outlined the results of the completed National Agricultural Lands Study (NALS) to the group. He described the overall picture as America moving from an era of surpluses of agricultural land to an era where we're using most of the agricultural base.

NALS pointed out that by the year 2000, Americans will need all of America's cropland base—540 million acres—to meet the domestic and export demands. This acreage figure constitutes America's best cropland and about 127

Continued on next page.



Coastal Improvement Grants Available

On October 17, 1980, the Coastal Zone Management Improvement Act of 1980 became law. This bill reauthorizes, and strengthens, the current Coastal Zone Management (CZM) grants program for 5 fiscal years. The bill authorizes \$86 million a year for the CZM grants program: \$80 million for grants to States and territories of the United States to improve their manage-

ment of coastal zones, and \$6 million to administer the Federal program.

For the first time, \$20 million a year in Resource Management Improvement Grants (RMIG) is available for States and territories of the United States to buy land for public access to beaches, to redevelop urban waterfronts, and for low-cost shorefront construction. Previously, grants were available only for planning, not for buying land or for shorefront construction. To receive RMIG money, States

Continued on next page.

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Key Conservation Issues, cont.

million acres of potential cropland.

"This potential cropland is not in a land bank," Gray said. "It's in rangeland and forest land now. The only reason it's not being cropped now is because of its capability—it's costly to farm" because it requires more intensive farming and conservation practices and more fertilizers to produce a crop.

Gray's point was that if the best farmland is in urban, nonagricultural uses, we won't be able to draw on it and will have to seek less productive land which will in turn raise costs to producers and consumers.

NALS examined existing programs to stem the loss of agricultural land. Key ingredients of the effective programs included farmer-rancher participation from the initial stages, good technical support, and strong, local leadership.

But even with the key ingredients, Gray noted that the process takes "patience, patience, patience. On the average, it takes 1 to 5 years from the initial discus-

sion stage to a workable (land retention) program."

Fred Winthrop, commissioner of agriculture in Massachusetts since 1975, outlined increased roles for both State governments and conservation districts in resource conservation.

The increased State role is based on "the reality that there will not be a whole lot of Federal dollars available for conservation and States will have to pick up the slack," Winthrop said. Although States are willing to assume a larger role, many lack the statutory authorities and budgets to do it.

"States are going to have to foster closer working relationships with other groups—like conservation districts—to get the job done," Winthrop maintained.

One expanded role for conservation districts is "developing State and local plans for conservation and imaginative proposals for projects that will be the basis for Federal cost-share funds," Winthrop said. "It's not enough for conservation districts to identify resource problems and just provide

technical assistance."

A farmer himself, Winthrop maintains that "conservation districts maintain too low a profile." He urged them to take advantage of public sentiment, citing recent polls which showed that Americans are interested and willing to pay for conservation of natural resources.

"People have to know what conservation districts are doing and how you're helping them," Winthrop said.

The convention also featured 3 days of discussion forums which highlighted nearly 70 topics of national and regional interest. They ranged from innovative approaches to agricultural land protection, to tax incentives for conservation practices, and improving irrigation efficiencies through remote sensing.

Brad Anseth,
public information officer, SCS, Bozeman, Mont.

Dennis Hopper,
assistant executive director, Georgia Soil and
Water Conservation Committee, Athens, Ga.

Coastal Improvement Grants, cont.

must demonstrate satisfactory progress in achieving national coastal management objectives. After 1984, these States must also be making satisfactory progress toward inventorying and designating coastal resources that have biological or natural storm protection value.

The 1980 CZM Act authorizes, for the first time, \$3 million a year for States to coordinate coastal planning for adjacent coastal areas. "Where to put facilities like oil refineries, nuclear plants, hydro-

electric plants, and coal ports is a fundamental land use problem," said Soil Conservation Service Community Planner Warren Zitzmann. He says that the \$3 million authorized for interstate grants will encourage States to plan and locate energy facilities cooperatively.

The act authorizes \$48 million a year for States to pay part of the cost of directing their coastal management plans. Another \$9 million a year is available for States to designate estuarine sanctuaries and preserve islands.

The CZM Act, first passed in

1972, tries to insure wise use of the land and water resources of the Nation's coasts, including the coasts of the Great Lakes and the Gulf of Mexico. It established the Office of Coastal Zone Management in the National Oceanic and Atmospheric Administration, Department of Commerce, to distribute Federal grants to States directly from Washington, D.C. To be eligible for CZM grants, each of the 30 States that has at least some part touching ocean, the Gulf of Mexico, or the Great Lakes must develop a federally approved

Comments:

From the SCS Chief

For the past 45 years, providing technical assistance through conservation planning has been the backbone of all SCS programs. This is especially true today. In fiscal year 1980 alone, SCS assisted landowners with conservation planning on nearly 27 million acres. (See "Conservation Highlights" for fiscal year 1980 beginning on page 11 of this issue.)

Our primary objective in conservation planning has always been, and still is today, to reduce soil erosion. Last year, SCS assisted landowners in adequately protecting close to 46 million acres from erosion. Conservation planning initiates the process that results in reducing erosion and improving water quality, recreation areas, wildlife habitat, and many other environmental benefits.

Through conservation districts, SCS technical assistance is available to all of the Nation's landusers. Special programs are also available to deal with unique resource problems in specific areas. These include the Watershed Program, the Rural Clean Water Program, the Great Plains Conservation Program, and the Rural Abandoned Mine Program. These special purpose programs target assistance to where it is needed most.

Assisting landusers to develop a conservation plan is the beginning step in any conservation program. The program objectives may vary, but the process remains the same. Getting conservation on the land is what SCS is all about.



coastal management plan. The Secretary of Commerce decides whether to approve a State's plan, after Federal agencies, such as SCS, review and comment on the plan.

Currently, 20 States and all 5 island territories of the United States have federally approved plans. Two States that are near the top of the list of States with the most miles of coastline, Florida and Texas, may receive Federal approval by next year, along with New Hampshire. When Florida and Texas join, all the States along the

Pacific Ocean and the Gulf of Mexico will have federally approved plans.

The new CZM Act also expanded the Coastal Energy Impact Program to include the effects of coal production, as well as the effects of oil and gas drilling activities. This program gives money to coastal communities to build schools, hospitals, roads, and other facilities for serving development related to energy activities. Grant money for this program comes from a separate fund supplied from taxes on energy companies, not from the

\$86 million authorized for the CZM Act.

By 1990, some experts predict that 80 percent of the total United States population will be living within 50 miles of a coast. The 5-year extension of the CZM Act was a hallmark event of the Year of the Coast in 1980. It will help the country face a decade of coastal challenges that could become the Decade of the Coast.

Donald L. Comis,
assistant editor, *Soil and Water Conservation
News*, SCS, Washington, D.C.

News Briefs

Four New RC&D Areas Approved

The U.S. Department of Agriculture approved applications for four new resource conservation and development (RC&D) areas, covering 14.5 million acres in 29 counties. The four areas are located in Alabama, Iowa, North Carolina, and Oklahoma.

RC&D is a U.S. Department of Agriculture program to help people care for and use their natural resources to improve their community's economy, environment, and living standards. The Soil Conservation Service (SCS) leads this program and appoints an RC&D coordinator in each area.

The Ala-Tom area includes more than 5.5 million acres in southwest Alabama and is crossed by the Alabama and Tombigbee Rivers. In the southwestern corner of Iowa, the Golden Hills area covers more than 3 million acres. The Region H area covers almost 1.5 million acres in south-central North Carolina. Finally, the Great Plains area in the southwest corner of Oklahoma includes more than 4 million acres.

Most of these areas have problems with erosion, land use, sewage and water facilities, and recreation facilities. They also have social problems including unemployment, substandard rural housing, and inadequate health care.

To solve these problems, area sponsors will form an RC&D council in each of the four new areas to develop an open-ended RC&D plan for an entire area. This process, from the approval of the application to the development of a plan that is acceptable to the sponsors and the Secretary of Agriculture,

Useless Gaslights Make Good Birdfeeders

Elesa Tanprasert, soil conservationist for the Soil Conservation Service in Little Rock, Ark., has converted four gaslights at the McDermott Elementary School to birdfeeders as part of a conservation plan.

The birdfeeders can be built in 2 hours for about \$12, depending on the materials used and the number of feeders built. Tanprasert's design uses wood and transparent thermoplastic.

Tanprasert began working with the school in 1976 to correct serious erosion problems at the rocky, hilly school site. U.S. Army Reserve weekend crews built terraces on the steepest bank leading to the playground.

takes more than a year. Then the search for technical and financial help begins.

SCS will fund only soil and water conservation measures such as critical erosion control, flood prevention, farm irrigation, fish and wildlife protection, waterbased recreation, and agricultural pollutants control. The RC&D coordinator will help the RC&D council, and local sponsors, find funds for other measures from local, State, and Federal agencies, including RC&D funds from other U.S. Department of Agriculture agencies.

The U.S. Department of Agriculture has approved 194 applications for RC&D assistance to date. The first 10 areas received approval in 1964, 2 years after the Food and Agriculture Act of 1962 provided the Secretary of Agriculture authority to develop the RC&D pro-

"The children also helped with the erosion control," said Tanprasert. "They planted pine seedlings on a steep bank. They took pride in their work, trying not to trample the seedlings."

In 1978, the Lindenwood Garden Club adopted the main parking lot of the school as their community project. Club members are building a park in the middle of the parking lot with benches and a walkway that can be used by people in the community. Tanprasert suggested shrubs, trees, and ground cover for the area.

When the garden club was faced with the problem of four vandalized gaslights around the main parking lot, Tanprasert suggested converting them to birdfeeders rather than removing them.

Lindenwood Garden Club Presi-

gram. SCS has \$34 million authorized for this fiscal year, about half to fund RC&D measures and half to provide technical assistance to RC&D area and measure sponsors.

RC&D provides a way for local communities to grow and develop, while protecting their land and water resources.

Donald L. Comis,
assistant editor, *Soil and Water
Conservation News*, SCS, Washington, D.C.

Back in the Barn Again

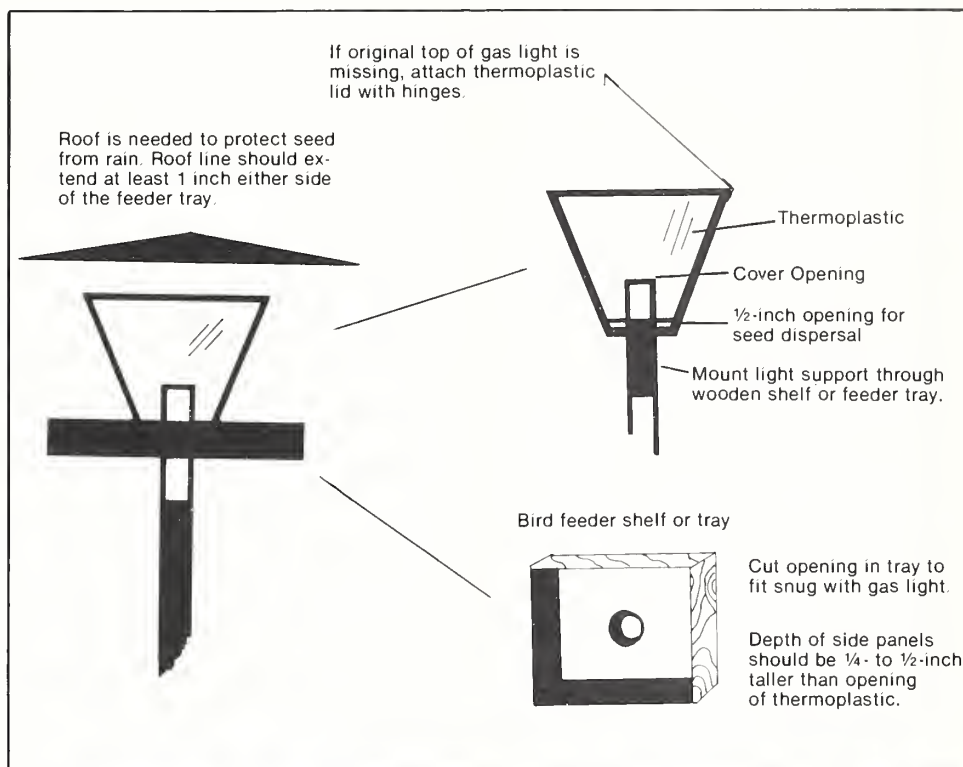
In the early days of the Soil Conservation Service, some offices were located in real barns. Later, there was a trend to locate in modern space to improve the agency's image.

"Now," according to George Collier, SCS area conservationist in

dent Judy Berrios described the park as "a perfect nature study area" just right for an outdoor classroom.

SCS produced television public service announcements in Little Rock featuring the McDermott Elementary School project. As a result of these announcements and other publicity, Tanprasert has received many requests for diagrams of the birdfeeders, some from people who moved from Arkansas to other States.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.



State College, Pa., "we've gone full circle and we're back in the barn again."

However, the barn that houses the area office isn't the cold, drafty version of yesteryear. This barn, which was built in 1814 and until recently housed a dairy herd, is fully modern, warm, and spacious.

SCS shares the barn with the owner who operates an interior decorating business. The space is tastefully decorated. Collier said, "It retains enough of its barn characteristics, like the big beams, to remind us of our priority job—to provide technical assistance to our Nation's farmers."

Frederick E. Bubbs,
public information officer, SCS, Harrisburg, Pa.



Area Clerks Dorothy Simpson (left) and Donna Krebs work in the area of the barn that housed the dairy cattle. The area office serves 14 counties in central Pennsylvania.

Diversified Agriculture—Unified Conservation

by Stephen K. Hedrick

Walter G. Woody, of the Sontag Community in Franklin County, Va., is a prime example of the love the people of Franklin County display for the land on which they live. Woody became a cooperator with the Blue Ridge Soil and Water Conservation District in 1945. In 1946, he combined seven small fields to form one large field and farmed the resulting field in contour strips. Other conservation practices visible on the Woody farm include grassed waterways, terraces, and a farm pond. Commenting about the past, Woody says, "Anyone could see that conservation was needed back then." Woody retired from active farming a few years ago, but still requires that all farming operations on his property follow the contour strips which were established in 1946.

Franklin County, located at the base of the Blue Ridge Mountains, has a diversified agricultural economy. Consequently, different sections of the county also have diversified soil and water conservation problems.

The eastern portion of the county is located in the Piedmont region, and tobacco is the major agricultural commodity. Conservation has been practiced in this area for a long time and is evidenced by fields containing terraces which were installed 30 or 40 years ago. Stripcropping, grassed waterways, and ponds for irrigation create a beautiful display of conservation.

This pleasant view is a secondary benefit of practicing conservation. The primary reason for

planning and applying conservation farming is controlling soil erosion and reducing the amount of sediment going into rivers and streams.

The central portion of Franklin County produces primarily dairy products. To realize a profit, dairy farmers have to achieve more and more production from the same land resource. Many of the dairy farmers are using larger machinery and are revising established conservation practices to accommodate the larger machinery. Some landowners are changing their cropping patterns from contour strips to even-width parallel strips. This reduces the number of short rows and minimizes the number of times heavy equipment must pass over the same ground. Others are installing diversions to help remove water safely from long slopes and make it possible to cultivate land more intensively without creating erosion problems. Several variations of conservation tillage are also practiced extensively in this area.

In the western part of the county, apple and peach production predominates. The production of these agricultural products usually does not cause any erosion hazards since many producers plant their orchards on the contour and use adequate ground covers. Farming on the contour also makes it possible to operate equipment more safely. Several ponds which provide water for spraying operations are also found in this section of the county.

Conservation farming has become a way of life with the people of Franklin County. W. W. Naff, Sr., director for the Blue Ridge Soil and Water Conservation District for 40 years as well as a conservation-

oriented dairy farmer and fruit producer, states, "Franklin County has a very diverse population and agricultural economy. However, every group in the county is ready to utilize conservation measures which will preserve the soil resources for future generations."

Stephen K. Hedrick,
former district conservationist,
SCS, Rocky Mount, Va.

Promoting Conservation Tillage

Conservation tillage is one of the most effective means of preventing erosion in Oklahoma. To encourage farmers to take a closer look at this type of farming rather than clean tillage, a special demonstration was started last fall in Garfield County.

Eight farmers with just over 200 acres are involved in the pilot program. USDA's Agricultural Stabilization and Conservation Service has set up a special program to cost share in chemicals for weed control, the Soil Conservation Service is providing technical assistance, and the Garfield County Conservation District has bought a special drill designed for seeding in heavy straw. The district also purchased a trailer to move the drill from landowner to landowner.

The purpose of the project is to demonstrate how effective crop residue on the surface of the soil can be in reducing erosion and conserving moisture. Using this method of farming also reduces usage of fuel, since farmers do not go over the land as many times. Conservationists hope that local

farmers will see enough benefits in this pilot program to convince them to switch from moldboarding their land to conservation tillage.

F. Dwain Phillips,
public information officer, SCS,
Stillwater, Okla.

Focus on Safety: Office Hazards

Most Soil Conservation Service employees are lulled into accepting the office environment as being safe. This is far from the truth, as SCS accident statistics and data reveal. Listed below are some of the major causes of accidents or potential problems found in office areas:

- Extension cords are left lying on the floor, which may cause employees to trip.
- Paper coffee filters are left on top of warm coffeemakers, which may cause a fire.
- Refrigerators are ungrounded or used with light-duty extension cords.
- Chairs permit employees to lean too far back or are wobbly or broken.
- File cabinets are left open for others to walk into.
- Two-prong extension cords are used to supply current to a three-prong (grounded) electrical appliance with a heavy-duty cord, which may cause the small cord to overheat.
- Employees put combustibles into ashtrays.

James Engleka,
safety manager, SCS, Washington, D.C.

Energy Conservation Award Winners

Several conservation districts and district cooperators were among the 128 recipients of awards given in January under the President's Energy Efficiency Awards Program. The awards are presented to corporations, trade associations, small businesses, civic organizations, and individuals for their outstanding contributions to the national energy conservation effort in transportation and agriculture, or in the promotion of energy efficiency in the home.

Since July 1980, a total of 218 Energy Efficiency Awards have been presented.

Arizona

Among the conservation districts receiving awards was the Wellton-Mohawk Valley Natural Resource Conservation District (NRCD) in Wellton. The NRCD and the Wellton-Mohawk Irrigation and Drainage District won the award for conducting an onfarm irrigation efficiency improvement program on 61,800 acres. As of September 1979, there were 78 farms comprising about 11,700 acres being operated under this program—which began in 1975 (see article in the June 1977 issue of *Soil Conservation* magazine).

Irrigation water management plans and technical and financial assistance were provided by agencies including the Soil Conservation Service to participating farmers to help them achieve higher irrigation application efficiencies and reduce deep percolation. Overall irrigation efficiencies were improved from 56 to an estimated 72 percent.

Idaho

Idaho boasts an award-winning conservation district and a conservation district official. The Oneida Soil Conservation District shared its honor with the Deep Creek Irrigation Company of Malad Valley. Together they developed a gravity sprinkler irrigation system to replace an open ditch irrigation system. Before undertaking the venture, the irrigation company operated 16 miles of earthen canals to serve 5,000 acres and 45 landowners. One of these "landowners" was the city of Malad, with about 400 acres of lawns and gardens irrigated from the company's system. Onfarm irrigation efficiency was about 30 percent and delivery system efficiency was about 55 percent. The irrigation company was able to provide water for partial irrigation to only 2,800 of the 5,000 acres.

With completion of the new gravity sprinkler irrigation system, farmers and Malad residents have enough water to irrigate about 4,000 acres throughout the entire irrigation system. An additional 962 acres will receive partial irrigation in an average year. Annual savings in power costs are estimated to be between \$75,000 and \$100,000.

Idaho's award-winning conservation district official is William T. Dishman, associate supervisor of the Central Bingham Soil Conservation District, who operates a diversified family farm. He has built a solar-heated farrowing house and has installed a wind anemometer to determine the best location for a windmill for generating electricity for his farm. He also built a greenhouse attached to his home, and thereby supplies vegetables for the family almost

year round. Heat produced in the greenhouse provides a heat source for the home.

Dishman practices no-till farming on his tillable acreage and maintains several test strips to demonstrate the advantages of using this technique to neighboring farmers.

Iowa

Another no-till farmer, Wayne Frederick of West Branch, was presented with an Energy Efficiency Award. Frederick, a cooperator with the Cedar County Soil Conservation District, has grown corn and soybeans using no-till planting methods since 1972. In 1979, his corn yield per acre was 190 bushels. He estimates that no-till farming has cut in half the amount of fuel needed for his tractor over conventional tillage methods, and the overall investment needed for no-till farming—excluding harvesting—is one-fifth that of conventional practices.

Maine

The Frank W. Tozier family of Fairfield, cooperators with the Somerset County Soil and Water Conservation District who own and operate a large dairy farm, also came up winners.

Frank Tozier installed a bio-fermenter unit to recycle the manure for fertilizer, feed, and bedding. Substantial savings are being achieved—manure no longer must be spread daily onto the fields, less commercial fertilizer is needed, and pollution is reduced. Tozier has saved approximately 2,000 gallons of diesel fuel by streamlining his planting operations so that only one trip with a heavy disk and a sod buster is needed for land preparation of fields planted to

corn. A forage dump wagon is used in the field during corn and hay harvesting to eliminate the need of one truck during these operations—with a savings of between 600 and 1,000 gallons of gasoline per season.

The Tozier's installed a heat exchange system in the milking barn to capture the waste heat from the milk for heating water for cleanup operations. This saves an estimated 100 gallons of furnace oil per month.

Maryland

Another conservation district honored at the award ceremony was the Carroll Soil Conservation District. In the early 1970's, the district began promoting no-till planting in the county. Since then, the amount of cultivated land in the county planted using the fuel-saving method has skyrocketed from practically none to more than one-third of the 88,000 acres planted to corn, soybeans, and small grain.

In the past 3 years, the switch to no-till farming has resulted in a savings of approximately 268,000 gallons of fuel or, at \$1.05 per gallon for diesel fuel, nearly \$282,000. Approximately 37,000 additional acres in the county were planted using minimum tillage, a practice that realizes about half the fuel savings of no-till planting.

Nebraska

Two of Nebraska's award winners were the Small Farm Energy Project and a district cooperator from Wood River.

The Small Farm Energy Project is a nonprofit organization based in Hartington. It has carried on a research and demonstration pro-

gram to help small farmers adopt low-cost, energy-saving innovations using locally available materials and their own labor, to reduce the farmers' dependence on the petrochemical industry. These efforts included numerous applications of solar energy, the composting of organic wastes for use as fertilizer, the generation of methane from animal and crop wastes, the generation of electricity from wind, and many other alternative energy techniques.

The Lewis and Clark and Lower Elkhorn Natural Resources Districts have been involved in the project.

A cooperator with the Central Platte Natural Resources District, James Maloney of Wood River was another of Nebraska's Energy Efficiency Award winners.

Maloney has been a leader in promoting and using scientific irrigation scheduling procedures to conserve energy and irrigation water. For example, in 1979, he put 147 acres of corn under an irrigation scheduling program and compared the results with those from 37 acres that were irrigated under conventional practices. By season's end, the acreage under the scheduling program required three fewer irrigations—a savings of 5.22 inches of water per acre, or the equivalent of nearly 21 million gallons of water. Overall, he estimates that the scheduling program resulted in a 60-percent savings of energy and water over the conventional methods on an acre-equivalent basis.

Ohio

Neal Springer and his family of Mt. Vernon operate a 302-acre farm, with 250 acres in crops. The

Springer's farm is 100 percent no-till, which saves 68 percent of liquid fuel requirements compared to conventional tillage because of fewer trips across the fields and timely use of herbicides. No-till has also reduced soil erosion losses from an estimated 8 tons per acre per year, to less than 1 ton annually. Fertilizer requirements have been reduced approximately \$20 per acre annually, and a legume cover crop reduces nitrogen needs up to 50 percent while maintaining a constant corn yield. No-tillage allows Springer to increase acreage use on the farm as well as increase yields per acre; thus, he doesn't need to rent additional land that would require more road time with his tractor and other farm equipment.

By using an in-bin, low-temperature grain drying system and carefully selecting the days for drying, Springer saves an estimated 60 percent on this energy requirement.

Springer is a cooperator with the Knox County Soil and Water Conservation District and a Goodyear Conservation Award winner.

Pennsylvania

The Waybrights of Mason-Dixon Farms, Inc., in Gettysburg have built one of the first commercially successful methane gas digesters in the United States run on animal waste from their 800 milk cows (see article in the September 1980 issue of *Soil and Water Conservation News*). The system produces about 50,000 cubic feet of methane daily, which fuels an engine that generates most of the electricity used on the farm.

A second digester will be put into operation this spring and will

produce an additional 60,000 cubic feet of biogas. At this point, the system will produce more electricity than the farm uses.

The odor-free byproduct from converting the manure to methane is used for animal bedding; thus, the Waybrights no longer have to grow grain crops to produce straw. The new bedding results in a more disease-free environment that has greatly decreased the incidence of mastitis among the cows, thereby increasing annual milk production. The direct and indirect savings of this change in bedding material is estimated to be about \$36,000 annually.

The Waybrights are cooperators with the Adams County Conservation District.

Wisconsin

The Allen Beadles family, cooperators with the Taylor Soil and Water Conservation District, own and operate a small, diversified farm near Sheldon. They produce corn, oats, and hay on 200 acres of cropland, maintain a 40-cow dairy herd and 35 head of young stock, plus carry out timberstand improvement practices on additional wooded acreage. Energy conservation is emphasized throughout their home and farming operations. They have fully weatherized their home, and replaced an oil heating system with a woodburning furnace—harvesting firewood from their wooded acreage. Tractors and other farm equipment are serviced regularly by Beadles to maintain peak condition and fuel efficiency, and gasohol is used in all gasoline motors on the farm.

The Beadles estimate that they have reduced their dependence on fossil fuels by 30 percent.

Wyoming

The West Afton Sprinkler Company, Inc., was formed by 25 landowners who wanted to improve their irrigation system, which provides water to 2,000 acres of alfalfa, small grains, hay, and pasture. Under a resource conservation and development measure, the company received technical and financial assistance from the Soil Conservation Service to convert the original system, which was only about 20 percent efficient, to a gravity pressure sprinkler system. After the new system was installed, irrigation efficiency increased to about 70 percent.

Due to the increased efficiency, three times as many acres can be irrigated now with the same volume of water. Production has doubled, and the cost of maintenance and upkeep is minimal.

Finally, since the system is gravity pressured, there are no direct operating costs for energy.

SCS Assistance Aids Mother Earth Environmental Farm

by Frank Jeter, Jr.

The widely read *Mother Earth News* magazine is known as a wellspring of information on natural living, organic gardening, solar energy, and other aspects of "doing what comes naturally."

So perhaps it is "natural" that when the organization decided to create its own farm in the mountains of western North Carolina, it turned to the Soil Conservation Service for conservation assistance.

The farm is now beginning to take form in Transylvania County, one of the many scenic counties in the area which attract large numbers of summer visitors and—increasingly—people retiring to year-round living.

If you had been on a recent visit to the farm—not far from the publication's headquarters in Hendersonville—you would have seen much activity. Near a small solar greenhouse, already in place (and producing a small quantity of vegetables), a much bigger solar greenhouse is under construction.

A huge lake dominates part of the 623-acre tract, which has been named "Eco Village."

A shingled headquarters building, camping sites, picnic areas, and nature trails are also being installed, together with a network of roads to link the large area.

To receive technical assistance from SCS in developing a conservation plan, the *Mother Earth News* became a cooperator with the Transylvania Soil and Water Conservation District. According to the plan, 488 of their 623 acres will remain wooded, both for scenic appeal and to supply firewood and timber. Right now, hardwood from the forest is also playing an important role in building construction.

Some 60 acres will comprise the educational area, where classroom buildings, a reception office, nature trails, and picnic areas are being provided for the use of students who come to educational seminars that already are a popular item at Eco Village.

Thirteen additional acres will provide camping space for those coming to the educational workshops.

The 20-acre "Orchardland" now being developed will grow fruit and nut trees. Erosion-prevention measures, such as grass cover between the trees and contour planting, will be a standard practice in the orchard.

Another 25 acres will be used for producing food crops other than nuts and fruits. This cropland will follow good conservation practices—cover crops, use of residue to prevent erosion, field borders, and grassed waterways. The prac-

tices will be planned to fit the topography of the cropland, using SCS technical advice and assistance.

Even roads and other areas where the soil must be temporarily disturbed will be revegetated as soon as the machines have completed their work. A mixture of Kentucky 31 tall fescue and sericea lespedeza will be used for ground cover to prevent soil erosion.

In future years, the management of *Mother Earth News* plans to build residential buildings, including condominiums, on 17 acres. Passive solar homes, earth sheltered residences, and other ecologically sound design and construction will be used for each dwelling.

Frank Jeter, Jr.,
public information officer,
SCS, Raleigh, N.C.

This detail of the solar greenhouse under construction at *Mother Earth News* farm shows how split hardwood is incorporated with concrete to build the huge arching structure.



Conservation Highlights 1980

Summary of Activities of the Soil Conservation Service for Fiscal Year 1980

A large part of the true wealth of our Nation is its soil and water. But our soil and water resources are not unlimited. They are finite and vulnerable, as we are continually reminded by gullies, exhausted land, dust storms, and drought.

The technology of soil and water conservation, while never complete, can be more effectively used to reduce much soil erosion to acceptable limits, to increase rangeland and forest productivity, and to improve irrigation efficiency and water quality.

It was toward these objectives that the U.S. Department of Agriculture Soil Conservation Service employees worked during fiscal year 1980. Through the Nation's 2,925 conservation districts, SCS provided technical assistance to nearly 900,000 individuals and groups. More than 55,000 landowners signed up as new district cooperators during the year, seeking help with conservation planning on nearly 27 million acres. Women made up about 12 percent of the new district cooperators.

Other highlights of SCS conservation activities during fiscal year 1980 follow.

Conservation Help for Units of Government

SCS employees furnished nearly 104,000 services to 27,400 local and State governments during the year. SCS provides basic soil and water data used by local governments in preparing regulations on land use and control of sediment and erosion.

Conservation Tillage

Various forms of conservation tillage, including no-till, were used by U.S. farmers on an estimated 60 million acres of cropland in 1980, compared to about 4 million acres 16 years ago. SCS gives technical assistance to farmers using these modern tillage practices which save fuel and soil.

Snow Surveys

In the West, SCS had 476 SNOTEL automated data collection sites in operation by the end of fiscal year 1980. In addition, SCS snow surveyors took measurements of snow and other precipitation, temperature, and soil moisture at 1,600 snow course sites and issued 3,509 water supply forecasts.

Soil Surveys

In fiscal year 1980, a record 135 soil surveys were published and an additional 82 survey manuscripts with maps were sent to be printed. More than 61 million acres were mapped during the year.

Soil Research

The SCS National Soil Survey Laboratory in Lincoln, Nebr., began analyzing rain and snow samples for acidity and heavy metals as part of a long-term effort to assess the effects of acid rain in the environment.

In fiscal year 1980, SCS was also involved in the Agriculture and Resources Inventory Surveys Through Aerospace and Remote Sensing (AgRISTARS). It is a 6-year project designed to gain timely information about the Earth through remote sensing by satellite and special technology on the ground. SCS is cooperating with the National Aeronautics and Space Administration, the USDA Science and Education Administration, and other Federal agencies on the project.

Soil Moisture Monitoring

SCS began a 5-year monitoring project in fiscal year 1979 to obtain information needed to predict soil moisture for large areas in the conterminous 48 States. In fiscal year 1980, SCS was involved in a six-State soil moisture measurement project. The information will be used in making drought and crop yield estimates.

Range

SCS increased its participation in coordinated rangeland resource planning and management during the year. Coordinated resource planning is an interagency, cooperative effort on public and private lands that are so intermingled it is difficult to apply effective conservation practices on either the public or private land without including both.

SCS provided soil survey and vegetation information on 16 million acres for the Bureau of Land Management of the U.S. Department of the Interior. SCS also provided soil, range site, and vegetation information to other Federal and State agencies.

Requests for SCS assistance with brush management by prescribed burning and with planned grazing systems continued to increase during the year.

Plant Materials

SCS plant materials centers released five new conservation plants to commercial seed growers and nurseryowners in 1980. Three of the plants were native grasses which protect the soil in disturbed areas and provide forage for livestock. The other two releases were a native forb and a native shrub. The forb helps keep the soil from eroding and provides wildlife food and cover, and the shrub can be used in windbreaks to block undesirable views and provide a noise barrier. The plants are best suited to the West and Midwest.

Fish and Wildlife

In 1980, SCS received an increasing number of requests for technical assistance in fish farming, or aquaculture. To promote and expand SCS activities in aquaculture, SCS established a three-member National Aquaculture Activity team at Auburn University, Ala. The team will develop aquaculture policy, improve technical standards for aquaculture, and identify training needs.

Forest Land

SCS assisted landowners in applying forest land improvement practices on 1,099,772 acres of private forest land. Practices included tree planting, direct seeding, improved harvesting, and site preparation.

Recreation

Under the Food and Agriculture Act of 1962, SCS has USDA leadership in helping land users develop recreation resources and serves as liaison with other Federal, State, and local agencies that assist with recreation development.

In 1980, SCS continued to provide technical and financial assistance for establishing or expanding public recreation developments and assisted private landowners in developing commercial and noncommercial recreation facilities.

Small Watershed Projects

During fiscal year 1980, 11 small watershed projects were completed, bringing to 509 the number completed since the program began in 1954. These Public Law 566 projects combine conservation measures and structural and nonstructural measures to reduce flood damage and provide agricultural water management, municipal and industrial water, recreation, and wildlife habitat.

River Basin Studies

SCS has USDA leadership for water and related land resource planning assistance to Federal, State, and local governments. SCS also leads USDA participation in Water Resources Council interagency studies. During the year, river basin planning studies were in progress in more than 40 States, and 9 studies were completed.

Colorado River Basin Salinity Control Program

Under Public Law 93-320, SCS is cooperating with the Water and Power Resources Service of the U.S. Department of the Interior to reduce salt loadings to the Colorado River, primarily through improved onfarm irrigation water management measures. Under Title I of the act, SCS provides technical and cost-share assistance to irrigators in the Wellton-Mohawk project in Arizona. Structural practices have been installed on 112 farms, involving 16,179 acres, to date.

Under Title II, SCS conducts studies to determine the irrigation improvement measures needed to reduce salt loadings from designated Upper Basin irrigated salt-source areas. USDA technical and cost-share assistance for the installation of salinity control practices was provided in the Uintah Basin, Utah, and Grand Valley, Colo., in fiscal year 1980. SCS provided technical assistance for designing and installing needed practices on 500 farms. The practices include land leveling, water control structures, sprinkler irrigation systems, ditch lining, onfarm pipelines, and off-farm lateral lining and pipelines serving two or more farms.

Great Plains Conservation Program

In the 10 Great Plains States, 957 farmers and ranchers signed long-term contracts to apply permanent conservation measures on 2.5 million acres, bringing the total acreage covered to date under Great Plains Conservation Program (GPCP) contracts to more than 110 million. During fiscal year 1980, contracts were completed on 3.7 million acres.

Through the GPCP, SCS provides technical assistance and cost sharing to landowners to minimize the hazards of recurring drought and wind erosion.

Rural Abandoned Mine Program

SCS administers the Rural Abandoned Mine Program (RAMP), authorized by Section 406 of the Surface Mining Control and Reclamation Act. Through the program, SCS provides technical and financial assistance to land users in reclaiming soil and water resources of rural lands adversely affected by past coal mining practices. By the close of fiscal year 1980, the program's second full fiscal year of operation, 2,865 applications for assistance covering 104,650 acres of abandoned coal mined lands had been received.

Agricultural Conservation Program

Through the Agricultural Conservation Program (ACP), SCS provides technical assistance to farmers and ranchers who install enduring conservation practices on their land to solve environmental problems. The Agricultural Stabilization and Conservation Service administers ACP and provides financial assistance to participating landowners.

Rural Clean Water Program

In fiscal year 1980, 13 Rural Clean Water Program (RCWP) projects were selected for funding as authorized by the 1980 Agricultural Appropriation Act. Of these, three were selected for comprehensive monitoring and evaluation.

SCS, the U.S. Environmental Protection Agency, and the USDA Economics and Statistics Service are cooperating on developing guidelines for the monitoring and evaluation of the RCWP projects. SCS is responsible for coordinating technical assistance and monitoring activities.

Rural Development

In fiscal year 1980, more than 30 States benefited from SCS redirection and targeting of assistance to small farms and American Indians.

Important Farmland Inventory

As authorized by Section 302 of the Rural Development Act of 1972, SCS has the leadership role in USDA for inventorying the Nation's prime agricultural areas. By the end of fiscal year 1980, SCS had published important farmland maps which delineate prime and unique farmland for more than 500 counties.

Water Quality Management Planning

The elements of the U.S. Environmental Protection Agency's 208 Water Quality Management Plans which deal with agriculture have been developed for all but a few States. Through the Rural Clean Water Program and the Agricultural Conservation Program, the Agricultural Stabilization and Conservation Service is focusing conservation resources on priority areas identified in the water quality management plans. SCS is providing technical assistance.

Environmental Services

SCS reviewed 148 draft environmental impact statements for other agencies and received and processed about 594 other environmental documents during the fiscal year.

Work was underway to revise SCS cultural resource rules and regulations for integrating cultural considerations into the conservation planning process.

Flood Plain Management

SCS completed 47 flood plain management studies throughout the Nation during fiscal year 1980, under Section 6 of Public Law 83-566. Thirty-two of the studies were reimbursable flood insurance studies. The studies included data on natural and beneficial values served by flood plains. Local units of government use this information to develop, amend, adopt, and implement flood plain management programs.

Emergency Assistance

Under Section 216 of the Flood Control Act of 1950 and Section 403 of the Agricultural Credit Act of 1978, SCS obligated an estimated \$11 million in watershed emergency assistance to help States repair damage caused by floods and other natural disasters.

Perhaps the most spectacular event in which SCS was involved in fiscal year 1980 was the eruption of Mount Saint Helens. To curb erosion in the devastated area, SCS specialists planned aerial seeding of about 20,000 acres.

To begin cleanup and restoration activities in the vicinity of Mount Saint Helens, SCS received a supplemental appropriation of \$3 million for Conservation Operations and \$20 million for Emergency Watershed Protection. The funds are for the cleanup and aerial reseeding around the Mount Saint Helens volcano to prevent new flooding and to restore stream channels. SCS also provided technical assistance to farmers and ranchers in dealing with ash fallout.

Resource Inventories

In September 1980, SCS released Phase II of the comprehensive National Resources Inventory (NRI). Phase II included data on estimates of erosion from streambanks, gullies, roads and roadsides, and construction sites.

Data collection for the 1982 NRI, which will be used in preparing the 1985 appraisal and program called for in the Soil and Water Resources Conservation Act, was started in all States.

Resource Conservation and Development Areas

During fiscal year 1980, work continued in the areas authorized for assistance under the Resource Conservation and Development (RC&D) program, and six new areas were authorized for assistance. Objectives of the program, which is under SCS leadership, are to improve the condition and use of the RC&D areas' natural resources, environment, and economic, cultural, and recreational opportunities for residents.



Photo by Tim McCabe, photographer, Information and Public Affairs, SCS, Washington, D.C.

Summary of Progress Fiscal Year 1980

Reportable progress in
soil and water conservation
programs assisted by the
Soil Conservation Service.

Metric Conversion
To assist readers, information
in the tables is given in metric
and in units of common measure.
A hectare is equal to 2.471 acres.

Progress Item		Fiscal Year 1980	Cumulative to Sept. 30, 1980
Conservation Plans and Related Services			
District cooperators	No.	55,214	2,276,510
	acres	26,627,812	797,510,647
	hectares	10,776,127	322,748,137
Services to land users	No.	2,248,763	—
Individuals and groups assisted	No.	893,833	—
Individuals and groups applying practices	No.	427,123	—
Conservation plans	acres	21,720,086	621,850,728
	hectares	8,789,998	251,659,542
Conservation plans revised	acres	14,703,062	—
	hectares	5,950,248	—
Federal land units in coordinated conservation plans	No.	17	1,370
Federal lands in coordinated conservation plans	acres	5,586,421	20,965,869
	hectares	2,260,794	8,484,770
Conservation Help for Units of Government			
Technical services for area planning	No.	103,814	—
Land use and treatment site plan reviews	No.	22,080	—
Agencies assisted	No.	27,400	—
Resource plans	No.	966	—
Snow Surveys and Water Supply Forecasting			
Snow survey and water supply forecasts	No.	3,509	—
Resource Studies			
Resource studies	No.	3,278	12,051
Soil Surveys			
Soil surveys	acres	61,328,668	1,565,566,563
	hectares	24,819,371	633,576,108
Great Plains Conservation Program			
Contract applications received	No.	1,706	63,061
	acres	4,563,074	124,514,491
	hectares	1,846,650	50,390,324
Contracts signed	No.	957	58,045
	acres	2,497,610	110,434,282
	hectares	1,010,769	44,692,142
Contracts terminated	No.	194	3,891
	acres	276,567	4,812,993
	hectares	111,925	1,947,791
Contracts completed	No.	1,891	43,079
	acres	3,721,349	77,604,381
	hectares	1,506,009	31,406,062
Unserviced applications on hand	No.	4,338	—
Public Law 566 Watershed Projects			
Applications	No.	23	2,595
Authorized for planning	No.	11	1,794
Approved for construction	No.	5	1,227
Construction starts	No.	20	993
Projects completed	No.	11	509

Progress Item		Fiscal Year 1980	Cumulative to Sept. 30, 1980
River Basin Studies			
Initiated	No.	8	144
Completed	No.	9	91
Flood Plain Management Assistance			
Flood plain management studies completed	No.	15	203
Flood insurance studies completed	No.	32	301
Colorado River Basin Salinity Control Program			
Studies completed	acres	205,000	325,000
	hectares	82,962	131,526
Rural Abandoned Mine Program			
Contract applications received	No.	332	2,865
Contracts signed	No.	74	137
Unserviced applications on hand	No.	—	2,728
Land reclaimed	acres	835	835
	hectares	338	338
Safety and health hazards eliminated	No.	79	79
Resource Conservation and Development Areas			
Applications on hand	No.	54	244
	acres	236,065,000	1,045,108,000
	hectares	95,534,197	422,949,413
Areas authorized for assistance	No.	4	—
	acres	30,546,000	809,043,000
	hectares	12,361,797	327,415,217
RC&D area plans accepted	No.	3	—
	acres	18,381,000	740,123,000
	hectares	7,438,689	299,523,675
RC&D measures completed	No.	1,226	16,632
Land Adequately Protected by Conservation Practices			
Cropland	acres	10,783,285	
	hectares	4,363,936	
Pasture and hayland	acres	5,307,587	
	hectares	2,147,951	
Range and native pasture	acres	23,837,684	
	hectares	9,646,978	
Forest land	acres	2,014,604	
	hectares	815,299	
Wildlife land	acres	2,840,096	
	hectares	1,149,371	
Recreation land	acres	152,438	
	hectares	61,691	
Other land	acres	684,684	
	hectares	277,088	
Total Land Protected	acres	45,620,378	
	hectares	18,462,314	

CONSERVATION Research Roundup

Developing Tillage Systems for Efficient Nitrogen Use by Plants

Tillage and fertilizer practices promoting more efficient utilization of nitrogen by crops, while minimizing the potential for environmental damage, are being developed at three universities under cooperative agreements with the U.S. Department of Agriculture.

For the complementary studies, USDA's Science and Education Administration-Agricultural Research is providing \$65,000 to the University of Illinois, Urbana; \$65,000 to the University of Kentucky, Lexington; and \$129,000 to the University of Nebraska, Lincoln.

"With similar 3-year studies at locations representing the climate and soils of the central and western Corn Belt, upper Southeast, and Great Plains, we should be able to develop information with rather broad geographic application," says USDA Soil Scientist James F. Power of Lincoln.

He says harvested crops, on the average, recover only about 36 percent of the nitrogen added to the soil as fertilizer and in crop residues, manure, and organic wastes. Soil micro-organisms immobilize some applied nitrogen in a form not immediately available to plants or cause the release of nitrogen to the air. And some nitrogen may leach below the plant root zone to ground water as a potential pollutant of streams and lakes.

Making plants use nitrogen more efficiently will, besides minimizing pollution potential, save energy used in producing nitrogen fertilizer and help restrict farmers' rising production costs. About 40,000 cubic feet of natural gas is used in

producing 1 ton of anhydrous ammonia, which may be further processed to other forms of nitrogen fertilizer.

Tillage and residue management can modify the soil's physical, chemical, and biological properties to either favor or restrict transformations between various chemical forms of nitrogen and nitrogen movement in the soil, Power says. Scientists at the three universities are using a nitrogen isotope, depleted nitrogen-15, to monitor these transformations and movements as influenced by no-till and conventional tillage systems.

Sand Dunes Rebuilt in Years, not Decades

In 1961 along north Padre Island, Tex., the violent winds and waves generated by Hurricane Carla destroyed long stretches of fore-dunes, the first row of dunes on a beach which act as dams, preventing water from going inland and doing more damage.

After the hurricane destroyed the dunes, the U.S. Army Corps of Engineers contracted with Texas Tech University to do research and develop specifications for restoring the coastal sand dunes by using vegetation.

In 1968, Dr. Bill E. Dahl, Texas Tech professor of range and wildlife management, along with student assistants, began experimental plantings with two grasses native to the Texas coast, sea oats (*uniola paniculata*) and bitter panicum (*panicum amarum*). Both grasses thrived and proved successful in dune formation, reducing the required time for rebuilding a sand dune by more than 30 years.

"The grass is planted on the sandy beach," explained Dahl. "Loose sand, carried by onshore winds, accumulates over the plant and builds up. The leaves of the grass continue growing upward, sprouting out of the sand, thus trapping and accumulating more sand. Those dunes are now at 23 feet above sea level.

"It took 5 or 6 years for the principal dunes with plantings to coalesce with crests 18 or 19 feet high. It would take this process 40 to 60 years unaided by man," Dahl said.

Dahl worked on the planting project from 1968 until 1976, when the contract terminated. Since then he and other investigators have been waiting for a hurricane severe enough in force to test the man-made sand dunes for durability.

Hurricane Allen, the first major hurricane to hit the south Texas coast since the research began, attacked Padre Island on August 9 and 10, 1980. Investigators who studied the beach later found that all the north Padre Island dunes, originating from plantings on the beach, had survived the hurricane with minimal damage.

"We were concerned about whether those manmade dunes could withstand a major hurricane," Dahl said, "because the width of their base was only about 80 feet, compared to more than 120 feet for most residual natural dunes."

Investigators concluded that significant coast protection can be restored with minimal cost in 6 to 7 years.

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AGR 101



Meetings

April	19-22	Association of American Geographers, Los Angeles, Calif.
	19-22	National Council of State Garden Clubs, Inc., Atlanta, Ga.
	25-30	American Planning Association, Boston, Mass.
	29-May 1	Hardwood Plywood Manufacturers Association, Savannah, Ga.
May	4-7	Garden Club of America, Cincinnati, Ohio
	11-14	League of Women Voters of the United States, Washington, D.C.
	17-21	American Institute of Architects, Minneapolis, Minn.
	25-29	American Geophysical Union, Baltimore, Md.
	26-29	Agricultural Management and Water Quality, Ames, Iowa
	27-29	Southern Forestry Conference, Williamsburg, Va.
June	7-11	General Federation of Women's Clubs, Cedar Rapids, Iowa
	7-12	American Water Works Association, St. Louis, Mo.
	14-18	Outdoor Writers Association of America, Louisville, Ky.
	21-24	American Society of Agricultural Engineers, Orlando, Fla.
	21-25	Forest Products Research Society, St. Paul, Minn.
	22-26	Air Pollution Control Association, Philadelphia, Pa.
	28-July 2	American Seed Trade Association, Atlanta, Ga.
	28-July 3	National Environmental Health Association, Phoenix, Ariz.

New Publications

Producing Farm Crops

by Lester V. Boone, A. Chester Richer, and Harold K. Wilson

This is the third edition of an introductory textbook on the why and how of efficient crop production in the United States, for high school or vocational agriculture students as well as farmers or farm owners. The authors present basic principles and concepts of producing farm crops and usually relate these principles and concepts to practical farm situations. The authors use simple language and illustrate the text with simple diagrams and numerous photographs, mostly of farm equipment in action.

This book is available for \$16.65 from The Interstate Printers & Publishers, Inc., 19 North Jackson Street, Danville, Ill. 61832. (Order No. 2151.)

Pesticides in the Soil Environment

by Shahamat U. Khan

This book provides information needed to assess the environmental impact of pesticides more accurately. It discusses the factors that influence the fate of pesticides and their behavior in the soil: adsorption, movement, and degradation. Khan also discusses the persistence of pesticides in the soil, in soil animals, and in plants. This book may be useful as an advanced textbook or as a reference book for scientists.

This book is available for \$46.50 from Elsevier North-Holland, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017.

The Influence of Exurbanite Settlement on Rural Areas

by James D. McRae

This working paper is the third in a series prepared for the

Lands Directorate in Canada. It presents an overview of recent research on the resettlement of rural areas by nonfarmers and its effects on agricultural and recreational land. This paper also discusses the effects of this resettlement on the rural economy, society, and culture. The paper has a 13-page selected bibliography.

A limited number of copies is available from Paul Bircham, Lands Directorate, 20th Floor, Place Vincent Massey, Ottawa, Ontario, Canada K1A 0E7.

Cutting Energy Costs

by the U.S. Department of Agriculture

This 408-page book, the 1980 Yearbook of Agriculture, is designed to help bring down energy costs of farmers, foresters, homemakers, communities, and the food industry.

The four sections of the new yearbook are: agriculture and forestry, family living, commu-

nities, and alternative energy sources. Some of the topics in the book are how to grow crops with less energy, the do's and don'ts of home insulation, how your community can cut energy bills, and turning farm wastes into usable energy.

A copy of the book may be purchased by sending a check or money order for \$9.50 to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recent Soil Surveys Published

by the Soil Conservation Service

Alaska: Totchaket Area.
Arkansas: Logan County.
Indiana: Marshall County.
Nevada: Diamond Valley Area and Tuscarora Mountain Area.
South Dakota: Aurora County.
Texas: Bowie County and Oldham County.